Revision Number	Revision Description	Revised By	Revision Date
New	*Considered as starting document for revision change table*		
Rev 01	Added use of Forklift mounted man basket 4.1.2	S.Simoneau	9-20-12
Rev 02	Added JSA , SRL definition, requirement for swinging gate on scaffolds and Tool Safety Section .	G. Dawson	10-14-14
Rev 03	*Added to 4.2.1 – All Fall Protection Harnesses must have suspension trauma straps attached*	G. Dawson	01-13-15
Rev 04	Added requirement for tool lanyards on tools used on	G. Dawson	08-05-15
Rev 05	Added New Osha requirements for Fixed Ladders over 24	G. Dawson	08-02-17
Rev 06	Updated Procedure to meet Corporates New Requirements. Reviewed and bolded areas to show Fall Protection is Required at 4 feet and higher!	G. Dawson	01-26-18
Rev 07	Deleted option to not wear fall protection when working in scissor lifts.	G. Dawson	5/28/2019
Rev 08	Use of Personal Fall Limiters is Required for all Personal Fall Protection use on the Beaumont Site.	G. Dawson	6/25/2019
Rev 09	Updated Attachment B as required by Corporate Procedure Update.	G. Dawson	10/03/2022
Rev 10	Modified to include Rope Work Access and attachment F for Rope Work Assessment. Added 3.8.4 – SCBAs shall not be used on Yellow Tagged Scaffolds, as safety harness (fall protection) must be worn.	G. Dawson	10/08/24

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1 Purpose

The purpose of this document is to establish minimum work practices and requirements that protect workers from falls and other related hazards associated with elevated work for BASF Corporation (BC) personnel, Contractor Employees, and Contracted Employees.

2 Definitions

aerial lift
a power platform or a vehicle mounted work platform used to elevate personnel to above ground work locations and includes articulating boom platforms, vertical towers, and extensible boom platforms

anchorage point
a secure point of attachment for lifelines, lanyards, or deceleration devices

body harness
a fall restraint device component consisting of a harness system designed to spread shock load over the shoulders, thighs, and seat area

cage
an enclosure mounted on the side rails of a fixed ladder or fastened to a structure behind the fixed ladder that is designed to surround the climbing space of the ladder

A cage is also called a "cage guard" or "basket guard."

competent person
one who is capable of identifying existing and predictable hazards in the surroundings or work conditions that are unsanitary, hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them

connectors
a device used to couple (connect) parts of the fall protection system together (e.g., lanyard, SRL, vertical lifeline)

dangerous equipment
equipment such as vats, tanks, electrical equipment, machinery, equipment or machinery with protruding parts, or other similar unit, that, because of their function or form, may harm an employee who falls into or onto the equipment

designated area
a distinct portion of a warning line in which people may perform work without additional fall protection

fall hazard
any condition on a walking-working surface that exposes a person to a risk of harm from falling on the same level or to a lower level

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fall protection system
a system used to protect personnel from fall hazards and may include guardrail systems, safety net systems, or personal fall protection systems such as personal fall arrest, travel restraint, or positioning systems

fixed ladder
a ladder with rails or individual rungs that is permanently attached to a structure, building, or equipment

grab bar
an individual horizontal or vertical handhold installed to provide access above the height of a ladder

guardrail system
a barrier erected along an unprotected or exposed side, edge, or other walking-working surface to prevent personnel from falling to lower levels

handrail
a rail used to provide employees with a handhold for support

hoist area
any elevated access opening to a walking-working surface through which equipment or materials are loaded or received

hole
a gap or open space in a floor, roof, horizontal walking-working surface, or similar surface that is at least two (2) inches (5 cm) in its least dimension

IRATA
Industrial Rope Access Trade Association

ladder safety system
a system designed to eliminate or reduce the possibility of falling from a ladder

A ladder safety system usually consists of a carrier, safety sleeve, lanyard, connector, and a body harness. Cages and wells are not ladder safety systems.

lanyard
a flexible line or rope, wire rope, or strap that generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage

leading edge
the edge of a floor, roof, or form work for a floor or other walking/working surface, (such as a deck) that changes location as additional floor, roof, decking or form work sections are placed, formed, or constructed

A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.

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Rope Access Level III Technician

A person with the training, skills, experience, and certification necessary to:

- *Assume responsibility for the entire Rope Access work site, including management and guidance of other Rope Access technicians;*
- *Design, analyze, evaluate, and specify Rope Access systems;*
- *Direct rescue operations from Rope Access systems; and*
- *Perform advanced rescue from Rope Access systems.*

lifeline
a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline) or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline) and that serves as a means for connecting other components of a personal fall arrest system to the anchorage.

lower level
a surface or area to which a person can fall. Such surfaces or areas include, but are not limited to ground levels, floors, platforms, ramps, runways, tanks, equipment, and structures, or portions thereof

maximum intended load
the total load (weight and force) of a person, equipment, vehicle, tools, materials, and other loads the employer reasonably anticipates to be applied to a walking-working surface at any time

mechanical equipment
all motor or human propelled wheeled equipment used for roof work, except wheelbarrows or mop carts

mobile
means "manually propelled" or "movable"

mobile ladder stand (ladder stand)
a mobile, fixed-height, self-supporting ladder that usually consist of wheels or casters on a rigid base and steps leading to a top step

It may also have handrails and is designed for use by one employee at a time.

mobile ladder stand platform
a mobile, fixed-height, self-supporting unit having one or more standing platforms that are provided for means of access and egress

opening
a gap or open space in a wall, partition, vertical walking-working surface, or a similar surface that is at least 30 inches (76 cm) high and at least 18 inches (46 cm) wide, through which an employee can fall to a lower level

personal fall arrest systems
a system used to arrest a person in a fall from a walking working surface; consists of a body harness, anchorage, and connector; means of connection may include a lanyard, decelerator device lifeline, or a suitable combination of these

personal fall protection system
a system (including all components) used to provide protection from falling or to safely arrest a person's fall if one occurs. It consists of an anchorage, connectors, a body harness, and may include a lanyard(s), deceleration device, lifeline, or suitable combination of these

Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.

platform
a walking-working surface that is elevated above the surrounding area

qualified
a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project

Rope Access (RA)
a means of access by descending or ascending a main line while the worker is protected by a safety line. Rope Access also includes the use of climbing and aid climbing techniques with fall protection.

runway
an elevated walking-working surface, such as a catwalk, foot walk along shafting, or an elevated walkway between buildings

safety net system
a net placed below workers to catch them in the event that a worker falls

self-retracting lanyard (SRL) – personal fall limiter (PFL)
a deceleration device containing a drum wound line that can slowly retract from, or retract onto, the drum under slight tension during normal movement by a person; device automatically locks the drum and arrests the fall at onset of descent

SRL= drum attaches to anchorage point; safety hook attaches to harness D-ring

PFL= drum attaches to the harness D-ring; safety hook attaches to the anchorage point

SPRAT
society of Professional Rope Access Technicians.

suspension trauma
also known as harness hang syndrome (HHS), is an effect that occurs when the human body is held upright without any movement for a period of time

If the person is held suspended in a harness or tied to an upright object, he/she could eventually faint, and this could lead to a fatality.

through ladder
a type of fixed ladder that allows the employee to step through the side rails at the top of the ladder to reach a walking-working surface, such as a landing

unprotected sides and edges
any side or edge of a walking/working surface (except at entrance and another point of access) where there is no wall, guardrail system, or stair rail system to protect employees from falling to a lower level

warning line system
a barrier to warn employees that they are approaching an unprotected side or edge and which designates an area in which work may take place without the use of other means of fall protection.

walking/working surface (WWS)
a horizontal or vertical surface on or through which a person walks, works, or gains access to a work area or workplace location

well
a permanent, complete enclosure around a fixed ladder

3 Procedure

3.1. General Requirements – Walking-Working Surfaces (WWS)

3.1.1 Surface Conditions

a. *All surface conditions must be kept in clean, dry,* slip-free*, orderly, and sanitary condition.*
b. *When wet processes are used, drainage must be maintained and to the extent feasible, dry standing places, such as false floors, platforms, and mats must be provided.*
c. *Surfaces must be maintained free of hazards such as sharp or protruding objects, loose boards, loose grating, corrosion, holes, leaks, spills, snow and ice.*

3.1.2 Loads

Walking-working surfaces must be able to support the maximum intended load for the surface. Maximum safe load limits of floors within building structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except on floors or slab grades.

3.1.3 Access and Egress

Safe access and egress to and from walking-working surfaces must be provided.

3.1.4 Inspection, Maintenance, and Repair

a. *Walking-working surfaces must be inspected, regularly and as necessary, and maintained in a safe condition.*
b. *Hazardous conditions on walking-working surfaces must be repaired before*

next use. If correction or repair cannot be made immediately, the hazard must be guarded to prevent use or protect personnel until the hazard is corrected or repaired.

c. When structural integrity is involved, a Qualified person must perform or supervise the correction or repair.

d. When removing grating, and creating a fall through hazard to a lower level greater than four (4) feet (1.2 m), workers shall be protected from falling through the opening.

e. Grating shall not be walked on until it has been fastened in place.

f. Temporary floor openings shall be guarded to prevent exposure to the opening.

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3.2. Fall Hazard Assessment

- All elevated work activities need to be assessed for potential fall hazards. The assessment should include, but is not limited to, whether the elevated working surfaces (ladder, roof, scaffold, etc.) pose a fall hazard and the need for Personal Fall Protection System and anchorage to ensure the worker does not fall and contact the lower level or lower obstructions. If potential fall hazards exist, ensure a fall hazard analysis is performed that meets all the requirements listed in attachment D (Fall Hazard Analysis.
- *Overhead work should be evaluated to ensure "falling object" protection is adequate. Consideration for dropping tools, equipment, stacking tools or equipment near the edge of an elevated platform, etc. should be addressed. (See* Section 3.3.3*.)*
- Sites and/or units are responsible to include the fall hazard assessments in their hazard assessment evaluation or on the Safe Work Permit.
- The total fall distance from the working surface to the lower level or obstructions and the selected personal fall protection components must be evaluated to ensure the person will not contact the lower level or obstructions in the event of a fall.
- *Prompt rescue for a person in the event of a fall must be provided. The evaluation of rescue personnel, ladders, suspension trauma straps equipped on body harness, descending devices or other rescue equipment needs to be evaluated since there may be an instance in which a person cannot self-rescue (e.g., unconscious or seriously injured).*
- Refer to 3.13, *Personal Fall Protection Systems – General*, for other considerations during the fall hazard assessment to ensure that workers are protected from falls.

NOTE: Use self-retracting lanyards (SRL) or personal fall limiters (PFL) is required for all jobs above 4 feet that require personal fall protection. For special Rope Access Work (RA) this is will be managed under the SPRAT Protocols.

3.3. Duty to Provide Fall Protection and Falling Object Protection

3.3.1 Fall protection for working on and/or inspections of rolling stock (railcars, tank trucks, flat bed trailers, etc.) is not exempt from fall protection when fixed or portable fall protection systems are installed and are available or when fall protection is technologically or economically feasible. The expectation is that rolling stock can be positioned or spotted at a fall protection system, or portable units can be purchased to protect working on rolling stock.

3.3.2 **Guardrails systems, safety net systems or personal fall protection systems shall protect walking-working surfaces with unprotected sides or edges that are *four (4) feet (1.2m) or more to a lower level.*** Attachment A offers options for fall protection system for specific fall hazards.

3.3.3 *Protection from Falling Objects*

a. Materials and equipment shall not be stored within six (6) feet (1.8 m) of the roof or platform edge unless adequate guarding is provided at the edge to contain the material and equipment. When materials are piled, or stacked near the edge, they must be stable and self-supporting.

b. Where exposure to falling objects exists, head protection is required. In addition, one or more of the following is required:

- *Toeboards, screens, or guardrail systems must be erected to prevent objects from falling to a lower level.*
- *Barricade the area into which an object could fall, prohibit entry, and keep objects far enough from the edge or opening*
- *Erect canopy structures and keep objects far enough from the edge, hole or opening.*

c. Toeboards at least 3.5 inches (9cm), measured from top edge of toeboard to the level walking surface, with no opening exceeding one (1) inch (3 cm) opening at its greatest dimension is required along exposed edge of the overhead walking-working surface; and capable of withstanding without failure a 50-pound (222 N) force in any direction.

d. Where tools, materials, or equipment are piled higher than the top of the toe board, screening shall be installed from the toe board to the mid-rail across the entire opening. When materials are higher than the mid-rail, screening shall be installed from the toe board to the top rail across the entire opening.

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e. All openings in the guardrail system must be small enough to prevent objects from falling through the opening.

f. Where canopies are used for falling object protection, they must be strong enough to prevent collapse and be able to prevent penetration by falling objects.

g. Control of tools shall be maintained when working at heights. The use of tool straps/lanyards shall be used when other means are not possible.

h. When tools, objects, etc. require to be lifted to heights, tool bags and bolt bags specifically for hoisting shall be used.

i. Falling object prevention should be considered in safety talks, tailgate talks, pre-task plans, etc.

3.4. Protection from Fall Hazards and Falling Object Protection – Criteria and Practices

3.4.1. Guardrail Systems

- For construction details refer to N-S-CL 506 (Angle guardrails) N-S-CL 507 (pipe guardrails)
- ***Top rail*** *height 42 inches (107 cm) plus or minus 3 inches (8 cm) above the walking-working surface.*
- ***Mid-rail*** *height midway between the top rail and the walking-working surface.*
- *Where* ***intermediate vertical members*** *are used in place of mid-rails, the vertical members may not be greater than 19 inches (48 cm) apart.*
- *Where* ***screens and Mesh*** *are used in lieu of mid-rails, shall extend from the walking working surface to the top rail and along the entire opening.*
- *Guardrail systems must be capable of withstanding a force of 200 pounds (890N) applied downward and outward; 150 pound (667N) for mid-rails, screens, mesh, and other equivalent intermediate members.*

  a. Openings in guardrail systems used as a point of access shall be equipped with a self-closing gate that slides or swings away from the opening and is equipped with a top and mid-rail or equivalent intermediate member meeting the requirements of this section or an offset that prevents a person from walking or falling into the opening.

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3.4.2. Safety Net Systems

Safety Nets must comply with 29 CFR 1926, Subpart M.

3.4.3. Designated Areas – low slope roof work

a. *A Designated Area may be used when performing infrequent and temporary work greater than six (6) feet (1.8 m) from an unprotected edge.*

b. *The perimeter must be delineated with a warning line (rope, wire, chain or tape) that meets the following:*

- *has a breaking strength of 200 pounds (890 N)*
- *lowest point including sag is not fewer than 34 inches (86cm) and not more than 39 inches (99 cm)*
- *visible from a distance of 25 feet (7.6 m) away*
- *erected as close to the work area and not fewer than six (6) feet (1.8 m) from the roof edge*

c. *If work is greater than 15 feet to the roof edge, the waring line is not required.*

3.4.4. Covers

a. *Capable of supporting without failure, at least two (2) times the maximum intended load and is secured to prevent accidental displacement.*

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3.4.5. Handrails and Stair Rail Systems

a. *Handrails are used on walls as a handhold when no leading-edge fall hazards exist. Measure the required height of 30-38 inches (76-97 cm) from the leading edge of the stair tread to the top surface of the handrail. The previous height of 30-34 inches (76-86 cm) for installations prior to January 17, 2017, is grandfathered into new requirements.*

b. *Use stair rail systems when a leading-edge fall hazard exists. Measure the height requirement of not fewer than 42 inches (107 cm) from the leading edge of the stair tread to the top surface of the top rail. The previous height of not fewer than 30 inches (76 cm) prior to January 17, 2017, is grandfathered into new requirements.*

c. *For existing stair rails systems installed before January 17, 2017, the top rail of a stair rail system may serve as a handrail only when the height of the stair rail system is between 36 and 38 inches (91-97 cm) measured at the leading edge of the stair tread to the top surface of the top rail.*

d. *Stair rail systems installed after January 17, 2017, require a stair rail height of 42 inches (107 cm) with separate hand rails at heights of 30 and 38 inches 91 and 97 cm).*

e. *The handrail and stair rail must be a smooth surface, have a minimum figure clearance of 2.25 inches (5.7 cm) and not have a projection hazard at the end of the handrail or stair rail system.*

3.4.6. Cages, Wells, and Platforms Used with Fixed Ladders

For fixed ladder and cage details, reference N-S-CL 509: *Structural Steel – Ladder and Cage Details*.

a. *Compliance dates for protection systems on fixed ladders extending more than 24 feet (7.3m) above a lower level:*

- *<u>Existing fixed ladders</u> – installed before November 19, 2018, is equipped to have a personal fall arrest system, ladder safety system, cage or well.*
- *<u>New fixed ladders</u> – installed on or after November 19, 2018, is equipped with a personal fall arrest system or a ladder safety system.*

- *Replacement – When a fixed ladder, cage or well is replaced, a personal fall arrest system or ladder safety system shall be installed.*
- *Final deadline – On or after November 18, 2036, all fixed ladders shall be equipped with a personal fall arrest system or a ladder safety system.*

b. *When a fixed ladder is equipped with a personal fall arrest system or a ladder safety system, the ladder may extend up to 150 feet (45.7 m) before a rest platform is required.*

3.4.7. Ladder Safety Systems

- *Ladder safety systems shall allow employees to climb up and down the ladder without having to hold, push, or pull any part of the system while climbing.*
- *The connection between the connector or lifeline and the point of attachment to the body harness shall not exceed 9 inches (23 cm).*
- *Mounting for rigid or flexible carriers shall comply with the manufacturers' recommendations.*

3.5. Ladders (Fixed, Portable and Mobile)

3.5.1. Fixed ladders comply with N-S-CL 509: *Structural Steel – Ladder and Cage Details*.

3.5.2. *All ladders shall be used in accordance with the manufacturer's recommendations.*

3.5.3. *All ladders shall be inspected prior to each shift of use for proper working conditions and that it is free from visible defects.*

3.5.4. *Any ladder with structural or other defects shall be tagged "Do Not Use" or similar wording and taken out of service until repaired or replaced.*

3.5.5. Sites shall identify safe use practices for working from portable ladders in accordance with 1910.23(c) portable ladders.

3.5.6. *Ladders shall only be used for the purpose for which they were designed.*

3.5.7. Use and placement of portable ladders shall comply with 1910.23(c)(3), see Beaumont portable ladder procedure.

3.5.8. Mobile ladder stands and platforms shall be used in accordance with 1910.23(e).

Note: **Mobile ladder stands that are four (4) feet or higher require handrails. When the top step height is above ten (10) feet, handrails on three sides are required.**

3.5.9. Workers should stay positioned on the ladder within one (1) foot (0.03 m) of the side rails.

3.6. Stairways

Stairways shall be designed in accordance to N-S-CL 510: *Structural Steel – Stair Details*.

3.7. Dockboards

3.7.1. *Dockboards put into service after January 17, 2017, must be designed, constructed, and maintained to prevent transfer vehicles from running off the dockboard edge. This is not applicable if dockboard has no runoff potential.*

3.7.2. *It must be secured to prevent from moving out of a safe position.*

3.7.3. *The transfer vehicle on which a dockboard is placed shall be secured from moving while the dockboard is occupyed.*

3.8. Scaffolds

3.8.1. *Scaffolds used in general industry must meet the requirements in 29 CFR 1926, Subpart L (Scaffolds).*

3.8.2. *A competent person shall inspect scaffolds before each shift of use.*

3.8.3. Sites shall determine a scaffold tagging system for the documentation of the scaffold inspection for BASF scaffold use.

3.8.4. SCBAs shall not be used for work on Yellow Tagged Scaffolds. All Yellow Tagged Scaffolds require personal fall protection (safety harness/SRL/PFL). If breathing air is required, use Supplied-Air-Respirator/Air Hose.

3.8.5 Scaffold deck access points shall use a self-closing swing gate with a top and mid-rail or equivalent intermediate member.

3.9. Roof Work

3.9.1. *Determine appropriate Fall Protection systems in the Section 4.4 table (Attachment A) for roof work.*

3.9.2. *Fall Protection is required if working less than six (6) feet (1.8 m) from the unguarded roof edge.*

3.9.3. *Designated areas may replace the requirement for personal fall arrest systems when work is at least six (6) feet (1.8 m) but fewer than fifteen (15) feet (4.6 m) from the edge, and work is infrequent and temporary.*

3.9.4. *When work is not infrequent and temporary, a guardrail system, safety net, travel restraint system, personal fall arrest systems, or a designated area is required.*

3.9.5. *Guard skylights to protect workers from falling through to a lower level.*

3.10. Steel Erection

Comply with 29 CFR 1926 Subpart R for fall prevention requirements.

3.11. Rig-Hoisted Personal Platforms

Comply with 29 CFR 1926.1431 Hoisting Personnel.

3.12. Powered Platforms, Man Lifts, Aerial Lifts, and Vehicle-Mounted Work Platforms

3.12.1. *Fall protection or restraint systems shall be worn and attached to a point in the platform to not allow the person to be ejected and suspend from the platform.*

3.12.2. *The attachment point on the platform must be a designated and rated attachment point for anchorage. If the platform is not equipped with a manufactured anchorage point, appropriate measures shall be taken with the manufacturer to have one installed before using the platform.*

3.12.3. Anchoring to an adjacent pipe, structure or equipment while working from an aerial lift is prohibited.

3.12.4. Standing on the guardrail and or midrail of the basket is prohibited.

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3.13. Personal Fall Protection Systems – General

The required personal fall protection system shall be a body harness equipped with a front and back D-ring. a duel Personal Fall limiter PFL, and suspension trauma straps.

Note 1: Front D-rings shall only be used on ladder safety systems and for rescue. All other D-ring connections shall be to the back D-ring.

Note 2: PFL eliminates as much as twelve (12) feet (3.6 m) of the total fall distance a person can experience during a fall. Calculating a six-foot (1.8 m)
lanyard or a six-foot (1.8 m) worker height is not necessary. SRLs reduce total fall distances and do not require shock absorbers.

3.13.1. When selecting a body harness size, consult the manufacturer's size chart for worker height and combined weight for person and tools.

3.13.2. When fall protection systems are required, body harness and lanyards should not be the fall protection system of choice when loading flammables so the employee can move freely in case of a fire.

This should also be applied to loading highly hazardous chemicals (e.g., inhalation hazards, acid/gases) so employee can move freely in the case of a chemical release.

3.13.3. Lanyards and harnesses should be of the same manufacturer and at minimum, compatible with all connectors used.

3.13.4. *When nylon lanyards are used, they shall not be wrapped around sharp edges or hot surfaces.*

3.13.5. *Lanyards shall not be tied back to itself* ***unless*** *the manufacturer specifies tie-back capabilities.*

3.13.6. Insulated lines may not be used as anchorage points unless it meets the requirements of Attachment B and authority granted by the owner of the insulated line.

3.13.7. *Anchorage points must be such that a person can neither free fall more than 6 feet (1.8 m) or contact the lower level.*

3.13.8. *Anchorage shall be capable of supporting 5,000 pounds (22.2nK) per worker attached or shall be designed, installed and used as part of a complete fall arrest system which maintains a safety factor of at least two, under the supervision of a Qualified person.*

3.13.9. Conduit, cable trays, grating and handrails shall not be used as anchorage points.

3.13.10. *Personal Fall Protection systems and components subject to impact loading shall be immediately removed from service and shall not be used again until inspected by a Qualified person and determined to be undamaged and suitable for reuse. Full body harnesses and lanyards may not be placed back in service regardless of inspection.*

3.13.11. *Fall Protection systems shall not be used to lower or lift tools or equipment.*

3.14. Rope Access (RA)

3.14.1 All Rope Access (RA) work must be performed according to practices identified by SPRAT and IRATA

3.14.2 Prior to commencing work the Rope Access contractor will develop a Rope Access work plan that must be provided to the BASF Permit Issuer for review. For work greater than 50 feet elevation above grade, member of the site rescue team must review prior to issuing permit. The plan shall include at least, but not limited to, the following:

- Identification of the specific scope of work;
- Identification of the Rope Access systems and equipment to be used for the proposed work, and the inspection requirements for each;
- Identification of the members of the work team by name, their respective RA Technician level (I, II, or III), a list of their duties, and documentation of their respective training/certifications and medical clearances;
- Identification of the hazards associated with the work and actions that will be taken to mitigate the hazards;
- Identification of the personal protective equipment (PPE) to be used;
- Provisions for providing security to each anchor location; and
- Description of the self-rescue plan and means to notify BASF in the event that a rescue is necessary.

3.14.3 Each RA work crew must have a minimum of three (3) technicians for each job, at least one of which must be a Level II Technician
Technicians must be certified according to SPRAT or IRATA

3.14.4 Prior to initiating work, the RA Supervisor must complete a Job Hazard Analysis that must be signed by each work crew member.

3.14.5 All secondary tools and equipment (e.g., drills, hard hats, wrenches, etc.) must be secured or attached by lanyards to the harness of the worker while suspended.

3.14.6 RA Technicians must be protected by 200% tie-off whenever suspended with a separate back-up line that is independent of the main line. A separate Anchor point should be used for each line; however, when this is not possible then each line must have a separate anchor device.

3.14.7 Anchor points include uninsulated piping greater than 6" in diameter and structural steel components deemed acceptable by the Rope Access Supervisor. When pipe is to be used, an Ultrasonic Thickness inspection will be required to ensure adequate wall and strength. Other suitable anchors may be required and will be reviewed and approved on a case-by-case basis by the Rope Access Level III in conjunction with operations. Per OSHA, anchors must be capable. of sustaining a minimum static load of 5000 lbs.

3.14.8 Anchor lines must be protected from direct contact with sharp / abrasive edges or hot surfaces, either by separation distance or by physical protection (ex. Protective roller, plate, matting, etc.)

3.14.9 The area below RA work must be sufficiently barricaded and tagged.

3.14.10 All RA work must be stopped during unit and site emergencies, lightening, and severe weather alerts, and during other weather conditions (ex. High wind) deemed as unsafe by the RA supervisor.

3.15. Personal Fall "Arrest" Systems – Performance Criteria

3.15.1. *Horizontal Lifelines need to be "engineered" by a Qualified person or manufacturer due to the complexity of line tension, horizontal and perpendicular forces on line and anchors.*

3.15.2. Shock absorbing lanyards and Self-Retracting Lanyards SRLs come in many varieties. Make sure the proper device is recommended for the application.

3.15.3. A SRL/PFL is the required lanyard because it minimizes free fall, allow vertical mobility, and allow limited horizontal mobility from a fixed point.

a. *When used in a fixed overhead position, limit the horizontal movement (fewer than 30 degrees) to prevent swing fall hazards in the event of a*

fall.

b. Connectors for horizontal movement to a SRL/PFL must be compatible with the anchorage point(s).

c. Never keep the cable extracted when not in use.

3.15.4. *When vertical lifelines are used, each person shall be provided with a separate lifeline and should not require the person to continuously hold, push or pull any part of the system while climbing.*

a. Connections between the carrier or lifeline and the attachment to the front D-ring shall not exceed nine (9) inches (23 cm).

b. Vertical lifelines should operate without the use of hands when ascending or descending.

3.15.5. *Ladder Climbing Devices should not require the person to continuously hold, push, or pull any part of the system while climbing.*

a. Connections between the carrier or lifeline and the attachment to the front D-ring shall not exceed nine (9) inches (23 cm).

b. Mountings for ridged or flexible carriers shall be attached to the manufacturer's recommendations.

3.16. Inspections

3.16.1. *Personal fall protection systems must be inspected by the user before initial use during each work shift for mildew, excessive wear, damage (cuts, burns, torn stitching, defective hardware), and other deterioration, and defective components must be removed from service.*

Note: sites should include manufacturers inspection criteria for missing and non-legible labels, webbing and stitching pass/fail criteria. Labels can be replaced. Contact the manufacturer and follow their recommendations to obtaining replacement labels.

3.16.2. Documented, periodic, inspections shall be by a competent person at the frequency specified by the manufacturer, or not to exceed twelve (12) months.

3.16.3. Inspections forms are available from the manufacturer and should be considered for use when conducting periodic inspections. *At a minimum, the inspection should include who performed the inspection, the date of the inspection, serial number of the equipment, and a pass or fail status.*

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3.16.4. *Defective components and or components subject to a fall shall be immediately removed from service. Follow the manufacturer's recommendations for servicing, re-certifying, or retiring the component.*

3.16.5. *Retention records for inspections:*

a. Equipment in service – keep current year plus three (3).

b. Equipment out from service – keep one (1) year after removed from service.

3.17. Training

All BASF personnel, contingent employees, and contractor employees who might be exposed to fall hazards shall receive training such that each employee shall be able to recognize the hazards of falling and the procedures to follow to minimize these hazards.

Fall Protection training must be developed by a Qualified person and delivered in a manner that is understood. The contractor company is responsible for contractor training.

3.17.1. Training shall include as necessary:

- The applicable requirements of this document.
- *types of fall hazards in the workplace*
- *correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems and equipment to be used*
- *use and operation of guardrail systems, personal fall arrest systems, safety net systems, etc.*
- *proper set up and use of a Designated Areas, and any other protection system or equipment that may be used*
- *correct procedures for the handling and storage of equipment and materials and the erection of overhead protection.*
- *The role of employees in the fall protection plans.*
- *Proper storage of personal fall protection equipment when not in use.*

3.17.2. Re-training must be conducted when:

- *Reason exists to believe that any affected employee who has already received training does not have the understanding and/or skill required to be able to recognize fall hazards and the procedures to follow to minimize these hazards.*
- *Changes in the workplace or types of fall protection systems/equipment have occurred that make previous training obsolete.*

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3.18. References

29 CFR 1926 Subpart L	Scaffolds
29 CFR 1926 Subpart M	Fall Protection
29 CFR 1926 Subpart R	Steel Erections
29 CFR 1910 Subpart D	Walking-Working Surfaces
29 CFR 1910 Subpart F	Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms
29 CFR 1910.140	Personal Fall Protection Systems
29 CFR 1926.501	Duty to Have Fall Protection
29 CFR 1926.502	Fall Protection Systems Criteria and Practices
29 CFR 1926.503	Training Requirements
29 CFR 1926.1431 ANSI Z359.1-2016	Hoisting Personnel
CSA Z259 series	Safety Requirements for Personal Fall Arrest Systems, Subsystems, and Components
	Canadian Standards Association standards

3.19. Attachments

Attachment A	Fall Protection System Selection Table
Attachment B	Typical Tie-Off Attachments for One Worker: Maximum Allowable Spans for Beams Used as Fall Protection
Attachment C	Required Clearance Illustration
Attachment D	Fall Hazard Analysis Form
Attachment E	Rope Access Assessment Form

3.20. Abbreviations

ANSI	**A**merican **N**ational **S**tandards **I**nstitute
CFR	**C**ode of **F**ederal **R**egulations
HHS	**h**arness **h**ang **s**yndrome
OSHA	**O**ccupational **S**afety and **H**ealth **A**dministration
PFL	**p**ersonal **f**all **l**imiter
PPE	**p**ersonal **p**rotective **e**quipment
SRL	**s**elf-**r**etracting **l**anyard
WWS	**w**alking **w**orking **s**urface

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ATTACHMENT A

	Fall Protection Systems					
Protection from Fall Hazards	**Guardrail System**	**Safety Net**	**Personal Fall Protection**	**Covers**	**Travel Restraint**	**Ladder Safety System**
unprotected sides and edges >4' from lower level	x	x	x			
hoist area	x	x	x[1]		x	
holes	x		x	x	x	
dock boards*						
runway/sidewalks >4' from lower level	x		x			
dangerous equipment with no guard/cover	x				x	
openings	x	x	x		x	
repair pits, service pits, <10'	x[2]					
fixed ladders			x			x
stairways	x[3]					
scaffolds	x		x[4]			
roof work	x	x	x	x[5]	x	
Powered Platforms, Man Lifts Vehicle-Mounted Work Platforms			x		x	

* not required if solely used by mobile equipment and personnel are not exposed to fall hazards > 10ft and Dockboards are covered in their fall protection training.

[1] when railing is removed

[2] limit access within 6' (1.8 m) of edge, use floor markings, warning lines

[3] stair rail system for open edges when stairs have at least 4 risers. Follow Table D2 of 1910.28 for stairway handrail requirements.

[4] when a scaffold railing or decking is not in accordance with 29 CFR 1926, Subpart L

[5] cover or guard skylights or openings

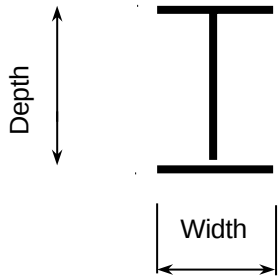
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ATTACHMENT B

Typical Tie-Off Attachments for One Worker

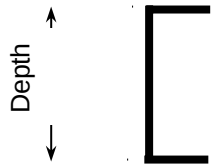
MAXIMUM ALLOWABLE SPANS FOR BEAMS USED AS FALL PROTECTION BEAMS

SPAN



DEPTH (in.)	MINIMUM WIDTH (in.)	*CASE #1 ALLOWABLE SPAN (ft.)	**CASE #2 ALLOWABLE SPAN (ft)
4	*4*	*Up to **10***	*Up to **6***
1	4	Up to **8.5**	Up to **6**
6	6	Up to **15**	Up to **8.5**
8	4	Up to **9**	Up to **6.5**
10	4	Up to **10**	Up to **7.5**
12	4	Up to **11**	Up to **8.5**

CHANNELS



DEPTH (in.)	*CASE #1 ALLOWABLE SPAN (ft.)	**CASE #2 ALLOWABLE SPAN (ft.)
6	Up to **6.5**	Up to **5**
8	Up to **9**	Up to **6.5**
9	Up to **10.5**	Up to **7**
10	Up to **11.5**	Up to **8**

***CASE #1: Tie-off beams are not loaded with existing external loading such as piping, tray, grating, etc. Load considered for allowable spans indicated above is a 3,600 lb concentrated force at midspan.**

****CASE #2: Tie-off beams are loaded with assumed existing external loading. Loads considered for allowable spans indicated above is a 3,600 lb concentrated load at midspan plus a 1,000 lbs/ft uniformly distributed load across the beam.**

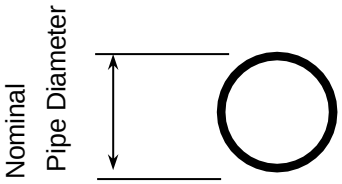
BEAM TABLES ARE BASED UPON THE FOLLOWING:

1. *Personnel use shock-absorbing lanyards **(meeting ANSI Z359.1)** that limit the load distributed to the body harness to 1,800 lbs.*
2. One worker is tied to a beam **within a given** span at any time.
3. *Table is not for lifeline (cable) anchorage.*
4. *Spans > 20 ft. shall not be used as an anchor point.*
5. *Allowable spans are designed per Case #1 & Case #2 loads indicated above.*
6. *Steel members are considered to have a yield strength of 36ksi.*
7. *Visually inspect end connections of members for any issues such as corrosion, missing bolts, etc. and have a minimum of (1) ¾" bolt connection on each side. Both ends of the beam must be connected (e.g. no cantilever).*

IF ANY OF THE ABOVE CONDITIONS CANNOT BE MET, ALTERNATIVE ANCHORAGE POINTS AND FALL PROTECTION SYSTEMS MUST BE APPROVED BY A QUALIFIED PERSON.

ATTACHMENT B

MAXIMUM ALLOWABLE SPANS FOR PIPES USED AS FALL PROTECTION PIPES



NOMINAL PIPE DIAMETER *(in.)*	MAXIMUM ALLOWABLE SPAN *(ft.)*
< 6	*Not Allowed*
6 and above	*Up to **20***

PIPE TABLE IS BASED UPON THE FOLLOWING:

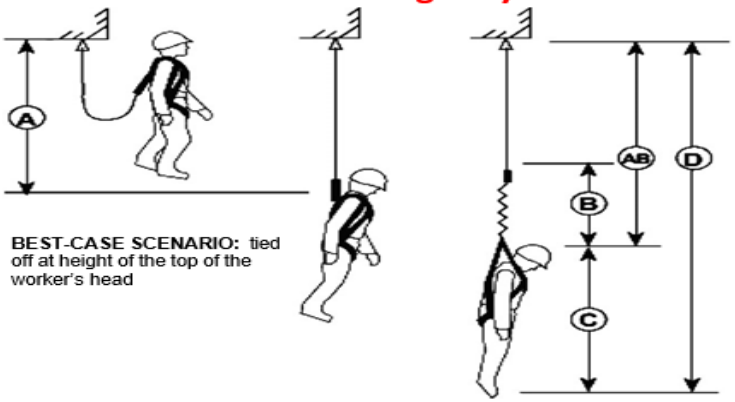
1. *Personnel use shock-absorbing lanyards **(meeting ANSI Z359.1)** which limit the load distributed to the body harness to 900 lbs (pipe spans are evaluated based on 1,800 lbs on OSHA requirements).*
2. One worker is tied to a pipe **within a given span** at any time.
3. *Carbon steel & Stainless-steel pipes*
4. *continuously welded pipe, i.e., no flanges or fittings within the tie-off span*
5. *nominal pipe diameter based on un-insulated lines*
6. *Table is not for lifeline (cable) anchorage.*
7. *Spans > 20 ft. shall not be used as an anchor point.*
8. *Basis of the above calculation is schedule Standard/40 and higher. Approval is required for schedule 10 and lower.*

IF ANY OF THE ABOVE CONDITIONS CANNOT BE MET, ALTERNATIVE ANCHORAGE POINTS AND FALL PROTECTION SYSTEMS MUST BE APPROVED BY A QUALIFIED PERSON.

ATTACHMENT C

Required Clearance Illustration

Traditional 6’ (1.83 m) Shock-Absorbing Lanyard



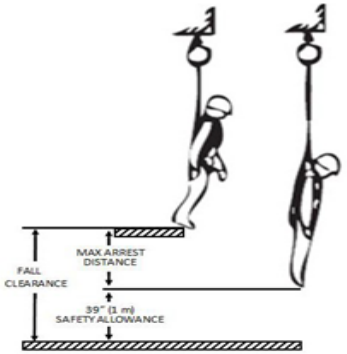
BEST-CASE SCENARIO: tied off at height of the top of the worker’s head

A = 6 feet (1.83 m)
B = 3.5 feet (1.07 m)
AB = 9.5 feet (2.9 m)
C = 6 feet (1.82 m)
+ 3 feet (0.9 m) Safety Margin

Total Fall Distance 18.5 feet (5.33 m)

If a person is working at a height fewer than 18.5’ (5.33 m) to the lower level, consider replacing the 6’ (1.83 m) shock-absorbing lanyard with an SRL/PFL. See the illustrations to the right for SRL/PFL calculations.

Class A SRL/PFL

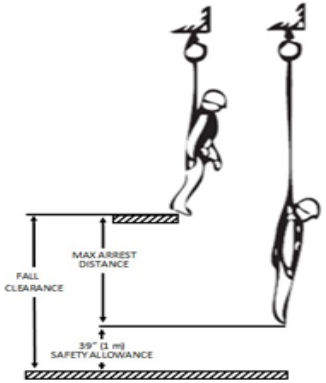


MAD = 2 feet (.61 m)

+ 39” (1 m) Safety Margin

Total Fall Distance
5’3” (1.61 m)

Class B SRL/PFL



MAD = 4.5 feet (1.37 m)

+ 39” (1 m) Safety Margin

Total Fall Distance
7’9” (2.4 m)

We calculate fall clearance with an SRL or a PFL differently from the process we follow with lanyards.

Simply measure from the ground to the work surface, eliminating the need to know the length of the connecting device as well as the worker’s height.

The best-case scenario is for the worker to be anchored above where he is standing. Then, one simply needs to know the labeled* Maximum Arresting Distance (MAD) SRL/PFL and the safety factor.

Not all cases will be the best-case scenario. If your anchor point is not elevated but is at the height of your back D-ring, you must add the length of the SRL/PFL as an additional “free fall“ variable on top of the MAD.

***Note:** Have a Class A or Class B retractable lanyard? Prior to ANSI Z359.14-2012, only Class B existed. All SRL/PFL units manufactured prior to 2012 incorporated a 54 inch MAD. After the 2012 ANSI revision, to meet limited clearance so not to hit lower levels, the class A, SRL/PFL was created. The design reduced the MAD of 24 inches.

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Fall Analysis Plan

Date: _____

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Attachment D

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Fall Hazard Analysis information				
Assessment by (name):				Shift:
Dept. / Company:		Supervisor Name:		
Scaffold or Elevated work location:				
How often will task be performed?	☐ Daily	☐ Weekly	☐ Monthly	☐ Annually
Notes:				

Identify Potential Hazards of Tasks		
☐ Elevated work platform	☐ Confined space	☐ Stairways
☐ Excavation	☐ Inadequate anchorage point	☐ Wall openings
☐ Floor opening	☐ Ladders (fixed / portable)	☐ Impalement hazard
☐ Structural work	☐ Scaffold (erect / dismantle)	☐ Leading edge work
☐ Roof work	☐ Proximity to dangerous equipment	☐ Other:
Describe hazards (include dimensions, locations, elevations, levels, etc.);		

Identify Protection Systems to be used		
☐ Harness w/ PFL	☐ Guard rail	☐ Beam sliders
☐ Scaffold	☐ Self-retracting lifelines (yo-yo, etc.)	☐ Catch platform
☐ Procedures	☐ Engineered lifelines	☐ Safety net
☐ Work platform	☐ Control zone w/ monitor	☐ Other:
☐ Self-propelled elevated platform	☐ Anchorage points installed	
Describe fall protection & means for prevention contact with a lower level;		

Dropped Object Protection		
☐ Barricades	☐ Covers on floor holes (marked)	☐ Other
☐ Signs	☐ Screens / netting on scaffolds	
☐ Catch netting	☐ Tool lanyards	

Method used to determine adequacy of Anchorage Points	
☐ Professional engineer	☐ Existing engineering / design documents
☐ Manufacturer's data	☐ Other
☐ Attachment B from Elevated Walking and Working Procedure	

Describe & Identify locations of anchorage points

Immediate Rescue Steps	
☐ Deploy & Use suspension trauma straps	☐ Use of rescue rope w/ knot
☐ Notify operations via radio	☐ Use of aerial lift or mobile platform
☐ Other employee in area to notify operations	☐ Other:
☐ Use of nearby ladder (location?)	
☐ Self rescue	

Name of safety attendant(s) for unguarded elevated work:			
Name	Date	Shift	Company

Analysis Performed by (signature):_____

Updates / Revisions to Fall Hazard Analysis			
Name	Date	Shift	Revisions

Rope Access Plan

Date: _____

We create chemistry

Attachment E

BMEHS 002.038

Section	**Scope of Work**			
Assessment by (name):		Date:		
Company:		RA Supervisor Name:		
Access work location:				
Elevation / Certifications?	☐ < 50’	☐ > 50’	☐ SPRAT	☐ IRATA
Notes:				

Section 2	**Identify Potential Hazards of Tasks**	
☐ Systems Evaluated	☐ Confined space	☐ Stairways
☐ Rescue Plan	☐ Inadequate anchorage point	☐ Wall openings
☐ Floor openings	☐ Equipment inspected	☐ Impalement hazard
☐ Leading edge work	☐ Proximity to dangerous equipment	☐ Other
Describe hazards (include dimensions, locations, elevations, levels, etc.);		

Section 3	**Identify Systems to be used**	
☐ Harness	☐ Separate Anchor Points	☐ Anchorage points installed
☐ Main Line	☐ Self-retracting lifelines	☐ Catch platform
☐ Safety Line	☐ Engineered lifelines	☐ Safety net
☐ Procedures	☐ Control zone w/ monitor	☐ Other:
Describe fall protection & means for prevention contact with a lower level;		

Section 4	**Dropped Object Protection**	
☐ Barricades	☐ Covers on floor holes (marked)	☐ Secured Hard Hat
☐ Signs	☐ Screens / netting on scaffolds	☐ Other
☐ Catch netting	☐ Tool lanyards	

Section 5	**Method used to determine adequacy of anchorage points**
☐ Professional engineer	☐ Competent Person Approved
☐ Manufacturer’s data	☐ Other

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Section 6	Describe & Identify locations of anchorage

Section 7	Immediate Rescue Steps
☐ Deploy & Use suspension trauma straps	☐ Use of rescue rope w/ knots
☐ Notify operations via radio	☐ Use of aerial lift or mobile platform
☐ Other employee in area to notify operations	☐ Other:
☐ Use of nearby ladder (location?)	
☐ Self rescue	

Section 8	Certification of Technicians (minimum of 3, One at Least Level II)		
Name	Date	Certification	Level (I, II, III)

Section 9	Duties of Technicians
Name	Duties/Role

Assessment Performed by (*Individual*): _____

BASF Review by Rescue Member (over 50’ Elevation): _____

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